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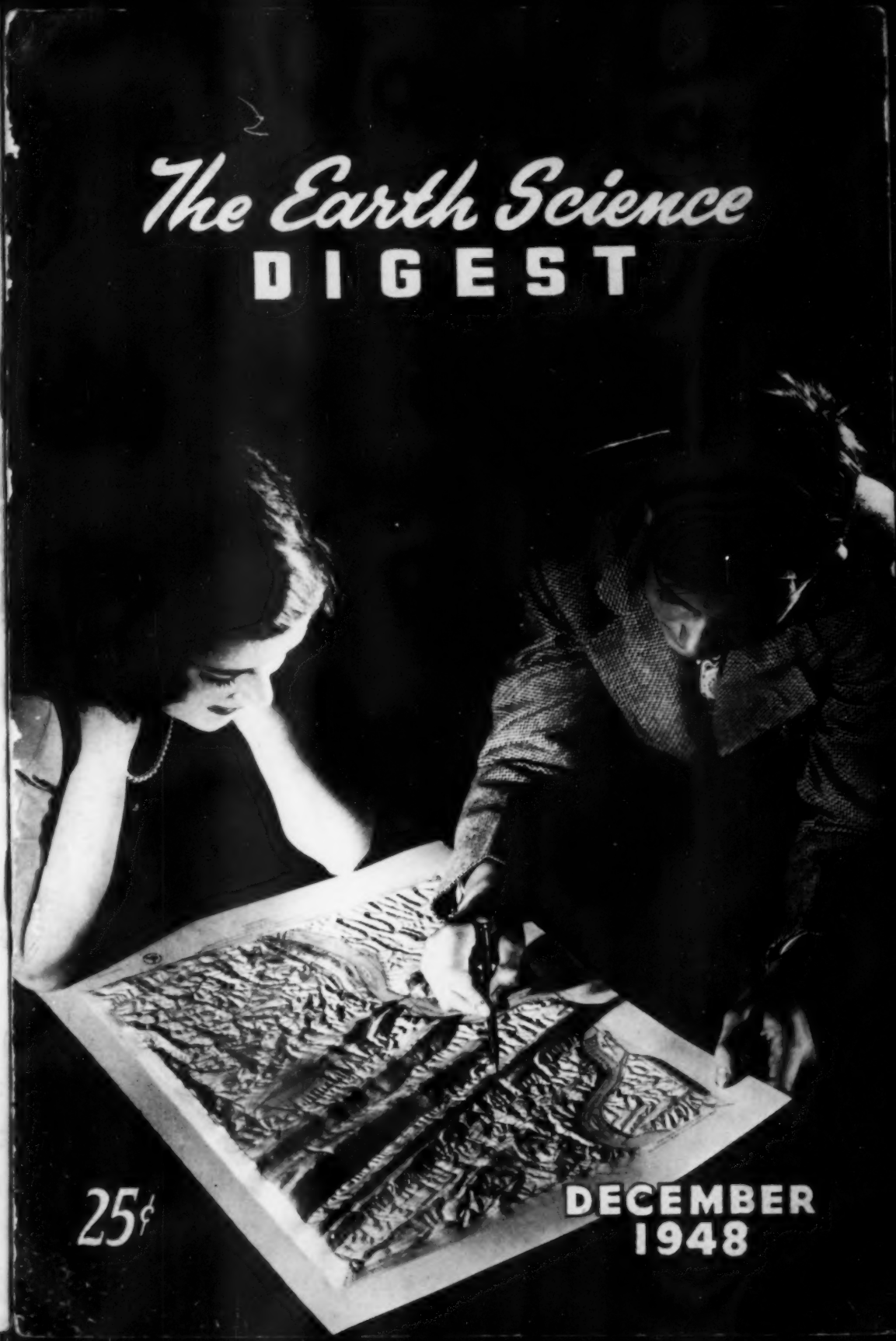

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Revere, Massachusetts

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S. Albert Eisenberg, Publisher
Gertrude Roberts, Business Manager

Vol. III DECEMBER - 1948 No. 5

Contents

GEOLOGISTS CONVENE IN NEW YORK CITY

Over 1500 earth scientists attended the annual meetings of the Geological Society of America, the Mineralogical Society of America, the Paleontological Society, the Society of Vertebrate Paleontology, the Society of Economic Geologists, and the Society for the Study of Evolution, which were held in New York City from November 10 to November 13.

We have presented the highlights of these meetings in this issue.

The Editor was pleased to receive favor-

able comment on **The Earth Science Digest** from many of those present.

GODEHARD LENZEN APPOINTED TO EDITORIAL BOARD

We are pleased to announce the appointment of Mr. Godehard Lenzen to the editorial board of **The Earth Science Digest.** Mr. Lenzen is co-editor of the new German semi-technical geology magazine **Achat,** and is vice-president of the Gesellschaft der Freunde der Mineralogie.

NEW DEFINITION OF A MINERAL PROPOSED BY DR. A. N. WINCHELL

NEW YORK, N. Y., Nov. 13—Dr. Alexander N. Winchell, of Yale University, criticised the old definition of a mineral as a natural inorganic substance of definite chemical composition, and proposed a new definition at the annual meeting of the Mineralogical Society of America.

Dr. Winchell would define a mineral as "a crystalline phase found in inorganic nature". He pointed out that **crystalline** would apply to nearly all the minerals, but would not be applicable in a few cases. He stated that "the tendency of the science of mineralogy is drifting definitely toward this concept" of placing less emphasis on the definite chemical composition when naming a specie.

Professor Winchell suggests that a group of minerals such as magnesite, siderite, rhodochrosite, smithsonite, and spherocobaltite, should be considered as sub-species, all being included under the species name of "brownspar". Diopside, augite, hedenbergite, johannsenite, acmite, and jadeite, would be subspecies of "polyaugite". Hornblende, he stated, should include seventeen different minerals now considered as separate species. Other examples were cited.

COVER PHOTO

Students examine a 17 x 22" plastic relief map, showing in relief the physiography of the Harrisburg, Pennsylvania quadrangle. See "Relief Maps - in Lightweight Plastic" on pages 19-20.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912.

OF THE EARTH SCIENCE DIGEST published monthly at Revere, Massachusetts, for October, 1948.

State of Massachusetts, County of Suffolk, ss.

Before me, a Notary in and for the State and county aforesaid, personally appeared Jerome M. Eisenberg, who, having been duly sworn according to law, deposes and says that he is the Editor of the Earth Science Digest and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Digest Publishers Co., Revere, Mass.; Editor, Jerome M. Eisenberg, Revere, Mass; Managing Editor, Jerome M. Eisenberg, Revere, Mass.; Business Manager, Gertrude Roberts, Revere, Mass.

2. That the owner is:
The Digest Publishers Co., Revere, Mass.
S. Albert Eisenberg, 77 Victoria St., Revere, Mass.

3. That the known bondholders, mortagages, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

JEROME M. EISENBERG, Editor

Sworn to and subscribed before me this 23rd day of October, 1948

MAURICE M. GOULD

My commission expires July 23, 1952

THE GROS VENTRE LANDSLIDE

H. P. ZUIDEMA
University of Michigan

Part One of a Two-Part Article

Fifty million cubic yards of rock and soil, carrying a forest with it, debouched down the steep slope on the north spur of Sheep Montain, near Jackson, Wyoming, forming a lake four miles long and 200 feet deep. The collapse of part of the natural dam two years later caused a disastrous flood. This is how the Gros Ventre Slide appears today.

—Photo by H. P. Zuidema

The face of the earth is ever changing, never at rest. Moving slowly through the years or with disastrous violence during an interval of minutes, the veneer of soil and weathered rock which blankets vast areas of hill and mountain slope is ever on the march, urged on by the pull of gravity toward valley floor, to inland basin, or sometimes down shore-line scarps and into the sea.

We may not be cognizant of the slow creek or flowage of masses of soil and loose rock unless we are on the alert for visible symptoms. Fence posts tilted downslope on a New England hillside, telephone poles out-of-plumb along an Ohio road, tilted retaining walls and characteristically bent trees are evidence of this slow motion.

Landslides may not have visible motion, but tell-tale, hummocky hillsides or a series of small, jagged terraces disclose what has been happening.

Rapid and disastrous large-scale

slides during which earth material moves swiftly are not numerous. Most humans are destined, happily, never to be on the scene of a major, fast-moving slide as it occurs. Three men, a rancher and two cowboys, were witnesses of one such slide, the Gros Ventre slide, which, in terms of tonnage of rock and soil, very probably was the biggest fast slide to occur in the United States in historic time.

At intervals during the twenty-third day of June, 1925, small slides had moved down the south slope of the Gros Ventre Valley, which winds through mountainous country east of Jackson's Hole, in Wyoming. Many persons living in the shadow of the Teton Range, which rises spectacularly along the west border of "The Hole", no doubt heard the rumblings of these slides, but either mistook the sounds for mountain thunder or dismissed them as indications of only minor slides which had not been uncommon in the area.

Guil Huff, a Gros Ventre rancher, however, decided to find out what was going on. He saddled his horse and rode past the north spur of Sheep Mountain and along the Gros Ventre River, which was in flood after weeks of rain and a thaw which had removed the snow from the slopes.

At about 4:30 p.m., as he reached the vicinity of the slides, "the whole face of the mountain appeared to tremble and then rushed, an avalanche of rocks, earth and trees, directly toward him. In terror, he turned his horse and rode for his life, but the slide outstripped his speeding mount and almost caught him. As he leaped from the saddle to open a gate, the roaring mass crashed through a fence, within about 30 feet of him."

Two cowboys, Forney Cole and Boyd Charter, also saw the slide and witnessed Huff's wild ride. Charter rode to the Horsetail ranger station of the Forest Service, two and half miles above the slide, and told the ranger, C. E. Dibble, what had happened downstream.

A close-up of the Gros Ventre Slide. The momentum of the rock mass carried debris nearly 400 feet up on the opposite of the valley. The men are standing on slide rock forced high up on the north flank. The old road and river channels are buried somewhere in the middle foreground. Most of the trees are new growth.
—Photo by H. P. Zuidema

Approximately 50 million cubic yards of debris had cascaded into the valley, blocking the river channel and partly burying the Huff ranch. The sliding mass had formed a dam 225 to 250 feet high and the flood waters were beginning to back up behind the dam.

In about 100 seconds, a mass of debris one and a half miles long and half a mile wide had completed its movement across the valley. The force behind it had pushed part of the slide rock nearly 400 feet up the opposite flank against the red sedimentary strata of the valley wall. A great scar, reaching

up the mountain slope to nearly twice the height of the Empire State Building, marked the slide zone.

The slide rock continued to settle during the evening and small slides were frequent. Mrs. Huff and a small daughter were taken to the ranger station and by 4 a.m. of the following day the last of the personal belongings of the Huffs had been moved by wagon from the ranch house. Although the house stood 60 feet above the river channel, water from the river was flooding the house. Later in the day it was floated from its foundation.

Another rancher, William Card, who lived a short distance upstream, moved out with the Huffs and the two families found temporary lodging down the valley.

A heavy rain on the night of June 29 caused Ranger Dibble to fear another slide in the saturated mountainside, and he planned to move out the following day. At midnight he was awakened by a roar of advancing water and, carrying his sleeping child, he and Mrs. Dibble ran for higher ground. When the roar of the water abated they returned to the ranger station, obtained clothing, started their car, and drove to higher ground, where they pitched a tent and remained until morning.

The slide continued to settle and terraces developed on the surface. A lake forming behind the dam expanded rapidly as it was fed by the flood waters of the Gros Ventre River and in about three weeks was four miles long, half a mile wide and some 200 feet deep. Three days after the Dibbles moved out, the ranger station floated out upon the lake.

The broken face of the mountain now presented an awesome sight. Below the head of the scarp was a line of trees standing on a mass which had dropped down a few hundred feet and had lodged there, but most of the timber in the slide area had been reduced to matchwood. Several hundred feet above the lake, east of the main slide, a lateral offshoot extended into the woods. The old Gros Ventre road was buried beneath hundreds of feet of debris. Large blocks of sandstone and limestone, some five to 15 feet in diameter, could be seen lodged among softer material on the outer face of the dam.

Water had begun to seep through the dam and the seepage took care of the inflow, which decreased as the dry season approached. By September the lake was nine feet below the high water mark.

Residents of the Gros Ventre Valley below the slide were concerned over the great body of water impounded by the natural dam. Some feared that a break eventually would occur and that the water would sweep down toward them. But several engineers, including representatives of the State of Wyoming, visited the scene and the consensus, according to the records of the time, was that the dam would hold. It was anticipated that the river would form a small channel over the lowest part and that no great danger of a sudden break-through existed.

Many years before there had been numerous slowly moving slides farther up the valley and in 1908 one of these blocked the river and brought about the formation of Upper Slide Lake, which still exists. The new lake became known as Slide Lake. By the end of 1926, residents in the Gros Ventre Valley seldom gave thought to the hazard and daily activities were resumed as of old.

But the stage was set for a still greater disaster which was soon to come, with tragic suddenness.

(End of Part I)

DR. BAILEY WILLIS FEATURES G. S. A. PROGRAM

Discusses "The Earth's Crust" During Annual Meeting

NEW YORK, N. Y., Nov. 12—Dr. Bailey Willis, 91-year old geologist, Emeritus Professor of the Department of Geology, Stanford University, California, had an appreciative audience of the continent's outstanding research geologists as he presented his ideas on the origin, structure, and dynamics of the earth's crust during the 61st annual meeting of the Geological Society of America in New York City.

He declared the crust of the earth is a thin skin of igneous rocks and derivatives 20 to 40 miles thick resting upon a solid shell of denser rock 1800 miles thick called the mantle; and the mantle encloses the core, a sphere about 4000 miles in diameter which appears to be molten. It is now known, Willis stated, from determinations of the age of uranium minerals that some rock masses of the crust are 2,000 million years old while some are about 30 million years old, and others range from great antiquity to the youngest—in fact the crust is still being built up. Global activity producing the crust has been at work from the earliest times and is still active. The age of a granite (chief constituent of continents) rock which contains uranium and lead minerals may be determined in millions of years by analyses that measure the proportions of uranium and lead, since uranium disintegrates into lead at a known rate.

Dr. Bailey Willis

Dr. Willis, born May 31, 1857 at Cornwall, N. Y., received his first college degree 70 years ago at Columbia University, and Honorary Ph.D., University of Berlin. He was geologist with the U. S. Geological Survey and had consulting assignments in Argentine, Chile, China, Africa, Japan, Philippines, East Indies and India. He is past-president and Penrose Medalist of the Geological Society of America, and honored member of many scientific organizations here and abroad.

CRYSTALS OF HALITE FROM KANSAS SALT MINES STUDIED

Hope for clues to localization of ore mineralization

NEW YORK, N. Y., Nov. 11—Halite (rock salt) specimens collected from the 900-foot level of the American Salt Company mine at Lyons, Kansas, taken from dry, stratified, undeformed salt beds within the Permian zone, revealed liquid inclusions — over ten per cubic inch. These factors, according to Professor Robert M. Dreyer of the University of Kansas, who presented his data at the 61st annual meeting of the Geological Society of America, Pennsylvania Hotel, are possible keys to determining the temperature of ancient seas. This in turn would be a clue as to where to expect ore deposition.

BLISTER HYPOTHESIS IS OFFERED BY DR. C. W. WOLFE

Explains Origin of Earth's Continents and Seas

NEW YORK, N. Y., Nov. 13—A new theory on the distribution of the seas and continents was presented by Dr. C. W. Wolfe of the Department of Geology, Boston University, during the 61st annual meeting of the Geological Society of America.

Professor Wolfe suggested that within a zone not more than 50 miles deep below the earth's surface, heat, primarily from radioactive disintegration, accumulates more rapidly than it can be dissipated, and a large convex upward lens of heated and expanded rock which is potentially liquid accumulates beneath the surface. This "blister" causes a doming of the overlying crust which may fracture and allow the escape of magma and heat with a subsequent collapse of the blister.

Dr. Wolfe is a member of the editorial board of the Earth Science Digest.

HEART-SHAPED "BAYS" OF CAROLINA FORMED BY TANDEM METEORITES

North Carolina Geologist Offers Novel Theory

NEW YORK, N. Y., Nov. 11—The "Carolina Bays", shallow sand-rimmed depressions confined to the Atlantic Coastal Plain in the two Carolinas and northeast Georgia, were likely born when tandem meteorites fanned out from a comet mass and fell in this area.

Professor W. F. Prouty, Department of Geology and Geography, University of North Carolina, Chapel Hill, N. C., explained this theory to geologists in sessions at the 61st annual meeting of the Geological Society of America.

Further evidence presented by Dr. Prouty gave details on how a trailing meteorite would hit the eastward-turning Earth farther west because of its smaller size, resulting in the later-formed odd-shaped depression in the earth's surface. These "bays" have been studied on the ground and from hundreds of aerial photographs.

GEOLOGIST DESCRIBES FLOW OF HEAT IN THE FRONT RANGE ROCKS

Studies show evidence of crustal thickening in mountain formation

NEW YORK, N. Y.—Nov. 12—The Alva B. Adams Tunnel recently completed by the Bureau of Reclamation, to bring water from the west to the east side of the Continental Divide in northern Colorado, provided 900 samples of rock as reported by geologist Francis Birch to the Geophysics Group at the 61st annual meeting of the Geological Society of America, Keystone Room, Pennsylvania Hotel.

This tunnel was driven 13 miles through the pre-Cambrian basement rocks passing from the West Portal at Grand Lake to the East Portal near Estes Park. Dr. Birch stated that temperatures were measured at 1000-foot intervals, in drill holes 6 to 10 feet deep and close behind the advancing face. These observations have been reduced with the purpose of finding the flow of heat in this region. So far, this evidence supports the conception of mountain roots as a thickened portion of the upper layers of the earth's crust.

The Earth Sciences — 1948

by Science Service

NEW FOSSIL SPECIES FROM AFRICA REPRESENTS NEAR-HUMAN PYGMY RACE

PHILADELPHIA, Nov 2 — Africa once had a pre-human race of pygmies — or near-pygmies — who lived in caves, knew the use of fire, and used big bones of game animals as clubs in hunting and fighting. Their average weight was probably under 100 pounds, yet they had brains as big as modern gorillas weighing four or five times that figure.

This description of a "new", although long-extinct, race of human (or near-human) beings sums up three years' work by scholarly pick-and-shovel men under the direction of Prof. Raymond A. Dart of the University of the Witwatersrand, Johannesburg, South Africa. He presents his findings in detail for the first time in the new issue of the American Journal of Physical Anthropology, published here.

Crucial find in establishing the identity of this race of little near-men was a broken piece of skull, representing a considerable section of the bulging back portion of the cranium. It has definite human characteristics, Prof. Dart declares.

In the same cave were many bits of charcoal embedded in the solidified debris, together with some bones that were also charred — strong evidence of the use of fire. Baboon skulls, always broken as by a heavy blow, he takes as evidence that the cave-dwellers were meat-eaters and hunters. Ends of long bones of animals are battered, as if used for clubs.

The new find belongs in the same general group to which the name Australopithecus was given some twenty-five years ago. The long word translates into English as "southern ape", because when the first fossils were discovered, and for a considerable time after that, it was thought that they were apes with some human characters, rather than small, highly primitive men. However, declares Prof. Dart, every find of Australopithecus that has been made since has tended to push him farther away from the apes and closer to human status. In this, he adds, several other researchers on ancient man agree with him.

Because the newly found skull fragment appears to be quite distinct from the Australopithecus types hitherto known, Prof. Dart considers it to represent a distinct species, and he has accordingly given it a new name: Australopithecus prometheus. The second or specific name is that of the hero of ancient Greek mythology who first taught men the use of fire, and is a reference to the traces of fire found in the cave.

VILLARICA, CHILEAN VOLCANO, NOT PREVIOUSLY A KILLER

WASHINGTON, Nov. 2 — Villarica, Chilean volcano, reported to have caused large losses of life and property in its present eruption, has had no previous record of fatalities, so far as sources available here indicate. Only casualties mentioned in its history were fish, cooked alive when a lava flow invaded their stream in 1640.

Aside from that it has been a moderately active volcano, with activity sometimes observed continuously over long periods, as in 1906–1908.

Apparently it was also active before white men began to keep track of it, for its Indian name, Quitrapillan, means "fire-god"—an indication that at least regionally the natives stood in awe of it.

TURTLE AND FISH FOSSILS DUG UP FROM WYOMING PLAINS

WASHINGTON, Nov. 2—Fossil bones of sea creatures of 100,000,000 years ago were dug up in the West during the past summer and have been brought back to the Smithsonian Institution here by Dr. D. H. Dunkle. Among them are the skull and jaws of a big sea turtle and the bones of several large fish that may have been distant cousins of today's tarpons.

These animals inhabited an ancient sea that stretched from Alaska to the Gulf of Mexico during Cretaceous time. Silts and sands of the old sea bottom, containing the bones dropped there when the animals died, have hardened into stone and been slowly raised to their present level, far from any ocean.

RED SEA LEVEL ON SINAI COAST HAS NOT CHANGED IN 3500 YEARS

PHILADELPHIA, Nov. 3—The Red Sea, whose waters are given Biblical credit for the miraculous overwhelming of Pharoah's army, has undergone no natural change in level worth speaking of in 3,500 years. This was disclosed before the meeting of the American Philosophical Society here this morning by Prof. William F. Albright of the Johns Hopkins University, who served as archaeologist with the University of California African Expedition.

The party investigated the western shore of the Sinai peninsula, which was the wilderness where the Children of Israel wandered during their long pilgrimage. There they discovered the main point of embarkation for the Egyptian turquoise miners who worked in the region about 1500 B. C. This point was only a few yards above sea level, and soundings proved that it had never been under water for any length of time.

Although the Sinai region is a bleak desert now, Prof. Albright added, it has not always been such a barren wilderness as it was even in the time of Moses. Evidence was found by other parties of the expedition that only a few thousand years before then it had been a good hunting-ground for men of the later Stone Age.

Among the archaeological accomplishments resulting from the expedition has been "the successful decipherment of the so-called proto-Sinaitic alphabet, which is the oldest known form of the ancestral alphabet, to which all existing alphabets go back."

IMPROVED SEISMIC METHOD OF LOCATING OIL USES OVER-GROUND SHAPED-CHARGE TECHNIQUE

SAN ANTONIO, Texas, Nov. 4—An improved method of locating probable underground petroleum deposits by the so-called seismic method was revealed here today by the Institute of Inventive Research. It is the work of Dr. Thomas C. Poulter, and utilizes "shaped charges" of explosive compositions which are set off above the ground, thus eliminating the cost of drilling shot holes.

Shaped charges go back to what physicists know as the "Munroe effect" which was announced to the world in 1888 by Prof. Charles E. Munroe. He found that if a hollow is made in an explosive cartridge on the side toward the object to be blasted, the effect is greatly increased. The hole can be conical or hemispherical in shape. The principle was well applied during the war in the bazooka rocket, which was far more effective in piercing armor plate than bullets.

In the seismic method of locating probable oil deposits under the earth, a seismograph similar to that used in observatories to record earthquake tremors is employed. But the tremors are man-made, and are rather minor. An explosive is detonated in a drill hole, the depth of which varies in different locations. Shock waves travelling downward deep into the earth are reflected back by certain structures if encountered. Experts, from a study of the recordings made by these reflected shock waves, are able to determine underground layers favorable to petroleum deposits.

Dr. Poulter's new method will provide economy in eliminating the need of boring holes, and it can be used in regions where boring would be exceedingly difficult, as in isolated mountainous country or in a search for oil under the sea. Dr. Poulter, who is associate director of Stanford Research Institute of Palo Alto, Calif., has tested his method against conventional procedures in various locations.

In his procedure, the charges in the explosive pattern are set on stakes relatively close to the ground and spread in a hexagonal design. Depending upon the type of records sought, comparatively light charges are placed from five to 85 feet apart and detonated simultaneously. The method may be used to produce an essentially flat wave front of low amplitude over a relatively large area.

SYNTHETIC QUARTZ CRYSTALS, SUITABLE FOR RADIO EQUIPMENT, NOW PRODUCED

FORT MONMOUTH, N. J., Nov. 24 — Synthetic quartz crystals, suitable for use in radio equipment, have now been produced in high-grade quality under sponsorship of the Army Signal Corps, it was revealed here.

During the month of September, the Brush Development Company of Cleveland delivered to the Signal Corps the largest synthetic quartz crystal, essentially free from defects, known to have been produced from any artificial source. The greatest dimensions of the sample are equal to the diameter of a silver dollar.

Quartz crystals are grown by deposition from a solution containing the raw material derived from quartz-sand or other silica materials, in a closed metallic container at a temperature of about 750 degrees Fahrenheit and at pressures as high as several thousand times that of the atmosphere. Individual molecules are deposited on a seed crystal in a regular manner to produce a larger model with the same shape as the seed.

It is believed that mass production of synthetic quartz crystals may be feasible, but considerable laboratory work must be done before they can be made economically. Their manufacture in this country would make the nation independent of natural quartz crystals which now come principally from Brazil. Relatively little satisfactory quartz for the purpose has ever been found in the United States.

The quartz crystals are used in radio transmitters, and in other applications, to regulate radio oscillation or radio wave frequency. A quartz crystal is what scientists call a piezoelectrical substance. It forms electrical charges on its surface when mechanically stressed, or exhibits mechanical strains when electrically charged. Other substances have the same properties, but none have been found that are as satisfactory in use or as economical as quartz.

SYNTHESIS GAS MADE FROM SHALE BY NEWLY PATENTED PROCESS

WASHINGTON, Nov. 5 — Synthesis gas, which is a mixture of hydrogen and carbon monoxide much used in industrial processes of many kinds, can

be produced cheaply from oil shale and low-grade natural gas by a process on which U. S. patent 2,452,634 has just been granted here to Dr. Alfred Clark, Phillips Petroleum Company chemist.

Oil shale and air, or even pure oxygen, are fed in at one end of a heated chamber, while carbon dioxide and steam enter at the other. Their reaction results in the production of the desired systhesis gas. When the spent shale, still hot, is withdrawn from the reaction chamber it is kept in contact with it on the outside, so that its heat may be salvaged for bringing the next batch of fresh shale up to reaction temperature.

INSECTS FROM CHINA'S DAWN REDWOODS BROUGHT TO CALIFORNIA ACADEMY

SAN FRANCISCO, Nov. 6 — First shipments of a collection of 60,000 insects from the Dawn Redwoods forest of China have been received at the California Academy of Sciences here, Director Robert C. Miller announced. An entomological expedition headed by Dr. J. Linsley Gressitt and sponsored jointly by the Academy and Lingnan University, of Canton, is now at work among the Chinese redwoods, recently discovered alive after having been known only as a fossil species.

The collection will be studied with especial care to find what relationships, if any, can be found between the insects that live among the Chinese redwoods and those of the redwood forest of the California coast. Any such possible kinships or resemblances among the insects will be significant in working out the lines of descent of the existing redwoods from the redwoods of 50,000,000 years ago, whose vast forests circled the whole Northern Hemisphere.

It has already been learned that Metasequoia, the Chinese redwood, is limited to one valley, named Shui-Hsapa, in Hupeh province. About a thousand trees have thus far been counted. Along with them grow oaks, beeches, birch, linden and rhododendron, giving the forest a strong resemblance to woodland areas in the eastern United States.

Part of the insect collections will be retained here by the Academy; the rest will be returned to Lingnan University.

SOUR CRUDE OIL IS HEADACHE TO OIL INDUSTRY

CHICAGO, Nov. 8 — Sour crude oil is a headache to the oil industry, judging from technical papers presented here today to the American Petroleum Institute. Sour crude oil is that way when it comes from the earth. It is oil that contains hydrogen sulfide and other sulfur compounds. It eats the tanks that store it and the pipelines that carry it to refineries.

West Texas is the area from which the greatest volume of sour oil comes, the Institute was told by R. A. Brannon of the Humble Pipe Line Company, Houston. It is, of course, produced from many wells in other sections. These sour oils are corrosive to tanks in varying degree, he said, depending upon the amount of sulfur and sulfur compounds, as well as the amount of other dissolved or suspended matter in the oil, such as salt water, iron sulfide, and other substances.

Most of the corrosion damage occurs on tank bottoms where salt water settles, and in the vapor spaces where moisure condenses. Reasonably satisfactory protective coatings have been developed for tank bottoms in the form of bituminous matter which is usually applied in the molten state.

There are four principal ways by which hydrogen sulfide from crude oil attacks steel pipe lines, the Institute was told by Lyle R. Sheppard of the Shell Pipe Line Corp., Houston. Sometimes there is a direct chemical action of the sulfide with the iron, and again the sulfide may oxidize to free sulfur which unites chemically with the iron.

Iron sulfides from these two actions form galvanic cells with iron in the presence of brine. Also there may be a creation of hydrogen-sulfide concentration cells which accelerate the sulfide or sulfur combination with iron. In all these four mechanisms hydrogen is liberated during the formation of the iron compounds. Mr. Sheppard discussed methods of corrosion detection and methods of prevention.

PLENTY OF OIL UNDER AMERICAN CONTINENTAL SHELF

CHICAGO, Nov. 10—Large petroleum accumulations exist under the American continental shelf and it is physically possible to get the oil from them, the American Petroleum Institute was told

here today by Mercer H. Parks and James C. Posgate of the Humble Oil and Refining Company.

Continental shelf petroleum production has passed the initial planning stage and as a result of successful drilling operations, at least two oil discoveries of possible major importance have been made, they said. These are both in the Gulf of Mexico.

Operations in open water encounter problems of the elements in addition to those usual on land. Auxiliary operations, such as transportation and drilling site preparation, they stated, become major items from technical and financial viewpoints.

The drilling sites now in use involve large platforms capable of supporting everything needed for drilling operations, as well as smaller platforms serviced by floating barges in a manner similar to that used in sheltered waters.

The two oil discoveries of possible major importance to which they referred are a producing well off Terrebonne Parish, La., of Kerr-McGee Oil Industries, Inc., and one drilled by the Humble Company off Jefferson Parish, La.

The first is a very shallow well, producing from a supercap sand through perforations about 1,750 feet deep. The Humble discovery came at a depth of about 8,650 feet in a second well drilled in the area. Until other wells are drilled, no proper evaluation can be made of the discovery, but the prospect is promising.

As generally understood, a continental shelf is the land mass lying submerged off the coast in less than some 600 feet of water. The United States continental shelf covers 750,000 square miles, of which 129,000 are in the Gulf of Mexico. This strip averages about 75 miles in width. It is in this Gulf shelf that oil men expect to find the best oil reserves.

MILLION BARRELS DAILY IS AIM FOR SYNTHETIC OIL FROM COAL

WHITE SULPHUR SPRINGS, W. Va., Nov. 7—Synthetic oil from coal, to the tune of 1,000,000 barrels daily, was given as the objective of a program outlined to the American Society of Mechanical Engineers here by J. D. Doherty of the U. S. Bureau of Mines. The cost of production, he said, should be approximately 12.5 cents per gallon.

Describing work in research and development already under way by the Bureau of Mines and others in the production of synthetic oil, he called attention to the need for prompt erection of at least some commercial plants because synthetic liquid fuels are not going to do us much good in an emergency if we have to start from scratch.

A completely new and detailed estimate of the coal reserves of the United States is being made by the U. S. Geological Survey, the engineers were told by Paul Averitt of the Survey staff. It will take 10 years to complete.

The coal fields of the United States are large in all dimensions, he said. They cover roughly 350,000 square miles, or approximately one-ninth of the total area of the nation. The coal-bearing rocks commonly are several thousand feet thick and, as in West Virginia contain as many as 117 named and correlated coal beds.

SOME SORT OF HUMANS LIVED IN CALIFORNIA 50,000 YEARS AGO

NEW YORK, Nov. 13 — When ice gripped the earth about 50,000 years ago, California was inhabited by some sort of human beings.

The remains of fires, tools and discarded shells of many ancient dinners have been found in short deposits near what is now La Jolla, the Geological Society of America was told here by Dr. George F. Carter, geologist of John Hopkins University, Baltimore, Md.

When these La Jolla men lived the sea level was lower than now and the ocean is now rapidly eroding the buried evidence of these very early Californians whose skeletons have not been discovered.

CASTS OF PYGMY APE-MAN'S FOSSIL BONES ARRIVE IN U. S.

WASHINGTON, Nov. 15 — Casts of bones of a pre-human race of pygmies-natives of South Africa a million years ago-have just been added to the collection of the Smithsonian Institution here. These fire-making, weapon-carrying "ape-men," who may represent the earliest known of man's ancestors, were discovered in the Transvaal by Prof. Raymond A. Dart of the University of Witwatersrand in Johannesburg.

Prof. Dart had the casts specially made for Dr. T. D. Stewart, Smithsonian curator of physical antropology. They represent the first casts to reach this country.

Cloudland Canyon State Park and Lookout Mountain, Georgia

A. S. FURCRON

Georgia Department of Mines, Mining and Geology

Cloudland Canyon State Park is up on the western side of Lookout Mountain, in Dade County. Lookout Mountain is a long, flat arm of the Cumberland Plateau, the top surface of which is 2,000 feet above sea level and 1,000 feet above Chattanooga Valley on the east and Lookout Valley on the west. This great plateau remnant is underlain by 1,500 feet of sandstone of Pennsylvania age. This great deposit of sandstone known as the Pottsville formation contains local deposits of conglomerate, and beds of shale and coal. Coal mines may be seen in various places on the mountain, and recently the coal has been strip-mined near Durham and Pittsburg.

The Durham quadrangle, prepared by the Tennessee Valley Authority, is a very excellent map of this section of Lookout Mountain. To go to the Park, it is convenient first to go to LaFayette and there take U. S. 27 and Ga. 2 northward, turning left 1.3 miles north of LaFayette on Ga. 2 at the sign to Lake Howard; continue on this highway to Cooper Heights. After leaving Cooper Heights you begin to climb the eastern slope to the mountain, passing upward through Ordovician rocks and Silurian limestones, Mississippian limestones and shales, to the top of the mountain at Stevens Gap (4.7 miles southwest of Cooper Heights). After climbing through the Mississippian limestones below the Gap, you pass through a thick deposit of shale of Mississippian age (Pennington Shale) just below Stevens Gap. This shale formation directly underlies the Pottsville sandstone.

A coal bed in the Pennsylvanian rocks of Lookout Mountain.
— Photo by J. Roy Chapman

After you drive over the western rim of the mountain at this place, you will see a cross-road on top of the mountain (Stevens Gay). The road to the right shows good exposure of the sandstone and close to the cross-roads you will see a thick bed of ripple-marked sandstone. These ripples were made by waves and currents as the sandstone was deposited in shallow water. At this particular locality, the crests of the ripples are at least three inches apart and are in the lower beds of the Pottsville sandstone. Note that the sandstone beds dip gently northwestward. This is because Lookout Mountain, although the highest section in this part of the State, is a structural basin. The beds dip inward and westward here, flatten out nearly horizontal in the middle part of the mountain, and dip eastward at the western edge of the mountain.

From Stevens Gap southwestward toward Cloudland, the hard road follows rather closely the southeast side of the mountain,

The State of Dade. Looking from Trenton from the western edge of Lookout Mountain. Pottsville sandstones form the cliffs on the right.
— Photo by J. Roy Chapman

thus many good views may be obtained. About one-half way to Cloudland on the left-hand side are two pinnacles standing alone upon the flat surface of the plateau. These are composed of sandstone and conglomerate and represent remnants of higher and more extensive beds which have been completely removed by erosion. This road intersects the Menlo road at Cloudland.

At Cloudland, a small coal bed may be seen along the highway just west of the Gap. The coal bed, 6 to 10 inches thick, rolls along directly under massive sandstone beds, and overlies 18 inches to 2 feet of fire clay. Fire clay is a very peculiar variety of clay produced under coal beds where the carbon dioxide from the plants has served to remove the soluble constituents, such as potash and soda, which tend to make the clay fusible.

Another common feature of the Pottsville sandstone is cross-bedding. Where this occurs, the beds dip rather steeply, but the dip was not produced by folding but was brought about by the deposition of sand upon the sloping surface. We know this is true because the dipping beds are underlaid and overlaid by horizontal beds. Cross-bedding is produced by current action. For example, when a delta is built rapidly outward, especially where the stream is swift and mineral particles are large, the sand beds laid down at the front of the delta are deposited upon its steep slope, but the bottom beds under them may be horizontal, and as these sloping beds accumulate, horizontal beds are deposited over them. If you will notice the highway cuts on your next trip to Lookout Mountain, you will see many excellent examples of cross-bedding.

Continuing westward on Ga. 2, 3.2 miles from Stevens Gap, you will come to the west side of Lookout. Here the State Highway Department has blasted away the sandstone beds to enable the highway to zigzag its way down to Trenton. Some call this spot the door to Dade. There is a very grand view here of the Trenton Valley, with the little city of Trenton nestled in the middle. Farther to the west, you can see the level summit of Sand Mountain, similar in height and rock formations to Lookout—another remnant of the great Cumberland Plateau. In 1860 Dade County seceded from the Union and set up the Free State of Dade. The County voted to rejoin the Union at the Court House in Trenton, July 4, 1945.

Rocks make interesting studies at this point, because they are well exposed along the highway which zigzags down the cliff, passing through in reverse order the same formations that we saw when we came up the eastern side of the mountain. At the "Door" in beds of Pottsville sandstone, down on

the left not far above the highway, you may see a little seam of coal a few inches thick, and over the coal bed there is a thick bed of conglomerate, with large, rounded pebbles of quartz. Over this the sandstone beds contain numerous rounded, flat fragments of dark colored shale. Note that the beds here dip toward the interior of the mountain, that is, to the southeast. Lookout Valley, cut into Cambro-Ordovician limestones by Lookout Creek is the most fertile part of the "State of Dade."

Continuing down the highway .2 miles, you will see another little coal seam in the cliff on the right, where the bloom is exposed, and farther down you will come again to the limestone. 3.3 miles by road from the top and just above the break with the valley, you will see Mississippian limestone (Saint Louis formation) filled with almost round concretions of chert. In other places, the concretions give way to thin, knobby beds of chert; also, you will see there black-coated stylolite zones. This limestone is quite fossiliferous, and several species of coral and brachiopods may be collected here.

Returning by the same road, you will see the road to Cloudland Canyon Park which turns off due north between Ga. 2 and Ga. 157 (Chattanooga Road). The entire park area contains 2370 acres, but this road will lead you to the choice view in this entire section, as you come to the point between Daniel Creek (left) and Bear Creek (right). From the point you look almost due north toward Lookout Valley, down Sitton Gulch Creek. Trenton is somewhat over to the left, disguised by the western wall of Sitton Gulch. 1.1 miles from the point on the left side of the Gulch is Case Cave, still within the park area.

Door to Dade. View looking west toward Sand Mountain. This highway, recently constructed and blasted from solid sandstone beds, connect Dade County with the rest of Georgia.

— Photo by J. Roy Chapman

This is my favorite scenic spot in Georgia, because there is so much beauty, so much grandeur, and so much geology all packed into one sweep of the eye. The canyon walls are carved by the streams into the southeastward dipping, but nearly horizontal, beds of Pennsylvania sandstones. Pines and laurel seek the opportunity to grow upon every little shelf of rock, but so steep and precipitous are the walls that even in the summertime the beds are completely exposed. Here 2,000 feet above sea level you stand upon rock laid down 200,000,000 years ago in fresh water at sea level. It is known that most of these rocks were laid down in fresh water because coal beds are only formed in fresh water marshes. These were among the latest rocks to be laid down in this part of Georgia. After their deposition, the pressure of rocks from the east caused them to be lifted up to their great height. In more recent times, Sitton's Gulch has cut back from the edge of the plateau to form the scenery—the last and most recent episode in the geologic history of the Park.

(Reprinted from the Georgia Mineral Society News Letter.)

Letters To The Editor

Dear Mr. Eisenberg:

I was very favorably impressed with complimentary copies of the Earth Science Digest that came to the State Geological Survey, and was instrumental in having it added to our subscription list. It is excellent, being simply enough written to be intelligible to the geologically-minded layman, and at the same time maintaining a high scientific level as to accuracy and scope of content. I feel it is just what the growing popular appreciation of the Geological Science requires, and of course do not hesitate to say so to the many contacts made in the course of my popular education work for the Survey. . . .

Yours very truly,

GILBERT O. RAASCH,
Associate Geologist in Charge
Educational Extension Division
Illinois State Geological Survey.

Dear Sir:

In the article "Alberta Province May Be Canada's 'Oklahoma'" in the October issue of "The Earth Science Digest," the writer suggested a crude oil pipeline from Edmonton to the west coast of Hudson Bay for tanker shipment to any foreign port. I should like to point out fatuous thinking on the part of the writer for navigation season for the Hudson Bay opens August 5 and closes October 15.

Very truly yours,

J. J. SVOBODA,
Hammond, Ind.

OIL POSSIBILITIES IN ETHIOPIA REPORTED BY COLUMBIA PROFESSOR

NEW YORK, N. Y., Nov. 12—Possible oil pools, as yet undiscovered, may lie buried in eastern Africa, according to Hall Taylor, assistant professor of geology in Columbia University, speaking at the annual convention of the Geological Society of America. Professor Taylor returned earlier this year from Ethiopia where he conducted geological studies for the Sinclair Petroleum Company which holds a concession for petroleum exploration from Haile Selasse, emperor of the country.

Several thousand feet of sandstones, shales, limestones, and other rocks which appear favorable for the accumulation of oil lie in eastern Ethiopia, according to Professor Taylor. As yet these strata have never been drilled and tested for oil.

Sixty to one hundred million years ago, in the Mesozoic era, famous for development of dinosaurs in many parts of the world, seas covered much of what is now eastern Africa, reports Professor Taylor. Sediments carried into those seas from other lands gradually settled to the bottom, carrying with them organic remains which through countless eons since that time may have formed oil, if underground conditions have been favorable.

Last year the Sinclair company made preparations to drill a test well, but operations were temporarily suspended because of political disturbances. Equipment was kept ready, however, and on October 15th the company ordered a resumption of operations.

Continent Was Divided By Seas 70 Million Years Ago

NEW YORK, N. Y., Nov. 12—During the Cretaceous period, more than 70 million years ago, the western interior of North America was occupied by an arm of the sea which extended north from the Gulf of Mexico, and at one time cut the continent completely into eastern and western portions, as outlined by Dr. Loris S. Russell of the Royal Ontario Musuem of Paleontology, Toronto, Canada, during the 61st annual meeting of the Geological Society of America here at the Pennsylvania Hotel, Nov. 11-13.

During the late stages of this interior sea, Russell stated, there was much fluctuation of the shore line along the western margin, and deep-water conditions alternated with shallow-water and deltaic conditions.

In the sedimentary deposits left by this sea are preserved abundant fossils of marine animals, particularly mollusks and it is by these fossils that geologists recognize similarity or difference in age between the various Cretaceous deposits of the western interior. Most of the fossils occur in shale deposits, or in ironstone concretions within the shale, both occurrences representing relatively deep-water conditions, remote from the shore. In contrast, other occurrences of fossils are in marine sandstones, representing ancient beaches and deltas.

The kinds of fossils found in the shale occurrences are not usually the same as those found in the sands, but it has not been possible to say how much of this difference was the result of different environment, and how much represented changes in time. Only by comparing shale and sand occurrences known from other evidence to be of the same age could the differences due only to environment be recognized. During the summer of 1948 the author studied the upper part of the Bearpaw formation in southwestern Saskatchewan, one of the last formations to be deposited in Canada by the retreating sea. As a result of detailed surveys it was established that certain occurrences of fossil shells in ironstone concretions, representing the shale assemblage, were of the same age as other occurrences in sandstone.

The shale fossils include numerous ammonites (extinct relatives of the living pearly nautilus) and clam shells of heavy type. In the sandstone ammonites have not been found, and the clam shells are of more delicate type, and resemble those found on modern beaches. This discovery shows that shale fossils and sand fossils of the same age can be quite different. In using such fossils to determine the relative age of Cretaceous formations in the northwestern interior it is necessary to compare shale fossils with shale fossils and sand fossils with sand fossils, otherwise differences will be met with which are not the result of different age, but only of different environment.

GEOLOGICAL HONORS TO DR. GEORGE W. MOREY AND DR. HANS CLOOS

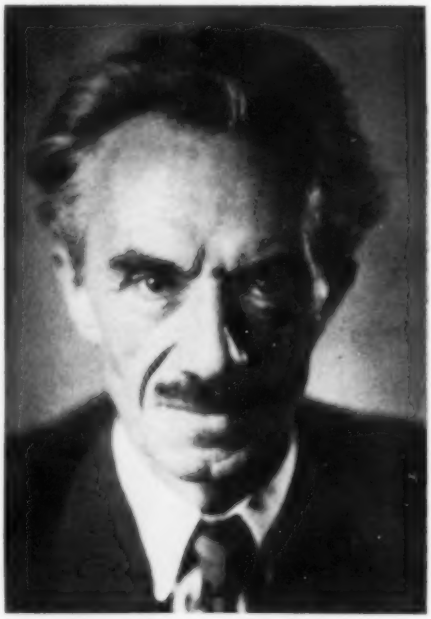
Gold Medals Presented to Two Geologists During Annual Conclave

NEW YORK, N. Y., Nov. 12—Featuring the annual dinner of the Geological Society of America during its 61st annual meeting was the presentation of gold medals to two scientists who have achieved distinction in the fields of mineral study and earth science.

Dr. George W. Morey was awarded the Arthur L. Day Medal for achievement in the application of physics and chemistry to the solution of geological problems. Morey, physical chemist with the Geophysical Laboratory, Carnegie Institution of Washington, since 1912, has published widely his laboratory findings proving the value of industrial research since he managed successfully the manufacture of strategic optical glass in both world wars. Dr. Morey is the initial recipient of the Arthur L. Day Medal.

The Penrose Medal, given in recognition of distinct contributions to scientific knowledge in the field of geology, was presented to Dr. Hans Cloos, Professor of Geology, University of Bonn, Germany.

Dr. James Gilluly, President of the Society, was toastmaster at the gathering of 700 geologists and guests. Presentation of medalist Cloos was made by Dr. Thomas S. Lovering of the U. S. Geological Survey, Washington; and Dr. Morey was presented by Dr. Herbert Insley of the National Bureau of Standards, Washington, D. C.



Dr. Hans Cloos

Dr. Closs is world-renowned among scientists for his recognition of diagnostic structures such as flow banding and joints in igneous rocks, from which the underground shape of the rock mass is inferred, and for his detailed field mapping. He has carried on geological work in many European countries and in Africa, and in Java and Borneo where he worked for the Shell Oil Company. He has published more than 80 scientific papers in his 38 years of professional work. Dr. Cloos was born in Magdeburg, Germany, Nov. 8, 1885, and received his Ph.D. degree from Freiburg i. Br. in 1910.

Prof. Cloos is to be lecturer before fifteen geological groups in eastern and mid-western colleges during this visit to the United States.

Always an anti-Nazi, Dr. Clos was active early in the war years in aiding fellow scientists to escape from Germany. Enough of his correspondence was seized to send him to a concentration camp but the evidence was luckily destroyed in an American air raid so he continued to teach at Bonn University and his students toasted the Allied victory when the Americans landed in North Africa.

In receiving this award Dr. Cloos personally represents an effort on the part of geologists to bridge the gap for international exchange of geological studies and discoveries.

RELIEF MAPS
In Lightweight Plastic

E. E. DANDO

Today the map makers' and map users' dream of lightweight, low cost, durable relief models is a reality. Using new plastic materials and applying mass production techniques, Aero Service Corporation of Philadelphia is now producing plastic relief maps showing typical geological and geographical formations in the United States.

Available plaster relief models are heavy—a problem to display and to store—and expensive. But these plastic relief maps are so light that a 17″ x 22″ quadrangle weighs but four ounces — only a little more than this issue of **Earth Science Digest.** These quads can be mounted on a display board with a pair of thumb tacks. Moreover, their quantity production keeps the cost low. A portfolio of 12 quadrangles, representing typical physiography in 11 states, costs less than a single plaster model.

Made of pre-printed white vinylite sheeting, these plastic relief maps are durable — retain their dimensional stability—and present land forms in striking relief for students of geology and geography and other sciences.

The heart of the process is the making of the master model, which is formed from a thin-gauge aluminum sheet on the Reliefograph, a special modelling machine.

The Reliefograph's small motor-driven trip hammer embosses the sheets according to the contour information which is photographically reproduced in register on both sides of the sheet. The operator works from the negative side

The thin-gauge aluminum sheet is formed and shaped into the master model with the Reliefograph. The operator works from the reverse side of the model—and high points are pushed down, rather than thrust up.

of the aluminum sheet so that the high points are pushed **down** rather than thrust up. Little by little, starting with the lowest contour and working down finally to the highest one, the aluminum sheet is formed and shaped until it represents accurately the contour information on the map and the physiography of the region. The degree of vertical exaggeration varies according to the character of the land form and the map scale.

From the finished master model a plaster mold is cast. Instead of forming the plastic sheets, then hand-coloring and hand-lettering the map information on the formed relief model, the flat plastic sheets are lithographed in three colors in precise register. These pre-printed plastic sheets are placed over the mold, and heat and pressure are applied. The vinylite assumes the form of the mold and the pressure is gradually released as the cooling

cycle takes place. The formed map is then stripped from the mold.

Leading educators under the direction of Dr. Arthur Howland, of Northwestern University, selected representative land forms best adapted for teaching purposes. Then, Dr. Don Carroll and his staff at the U. S. Geological Survey chose from the Survey's files the quadrangles which were most typical of these forms. These quads make up the portfolio of plastic relief maps.

These 12 quads cover the following areas: Soda Canyon, Colorado; Princeton, Indiana-Illinois; Harrisburg, Pennsylvania; Loveland, Colorado; Kaaterskill, New York; Mammoth Cave, Kentucky; Whitewater, Wisconsin; Chief Mountain, Montana; Mount Rainier, Washington; Oceanside, California; Point Reyes, California, and Barnegat, New Jersey.

Today over 400 colleges in the United States and abroad use the quadrangle portfolios in their geology classes. Though these plastic relief maps have been available only recently, educators hail them as an important new teaching aid.

There is a growing interest among secondary schools in these new teaching aids, which make physiography so real and memorable for the student.

In addition to the quadrangle portfolio, Aero Service also produces a Northeastern United States map, extending from Albermarle Sound on the south, northward to include all of the Atlantic Coast to a point just north of Portsmouth, New Hampshire. The northwestern corner of the relief map includes Rochester, New York. The map's scale is 1:1,000,000, and its vertical scale is exaggerated 10 times. It shows the Continental Shelf, with its spectacular canyons and valleys, in dramatic relief.

This map is 38 inches square, reproduced in three colors. Its weight is **only one pound,** compared to a weight of about 200 pounds for a plaster model of the same dimensions. Like the plastic quads, it is durable, readily dispalyed, and smudge or soil from classroom use can quickly be removed with a damp cloth.

Some educators have expressed interest in State relief maps, showing the land formations of the individual states. It is believed that these could be used at all teaching levels, almost from the primary grades to the college level, employing an elementary teaching approach with the younger pupil and a more scientific attack with the mature student.

Experiments are also being conducted by the company in the use of thermoplastic, thermosetting and elastomeric materials for relief maps.

DOVER CLIFFS CHALK STUDY REVEALS DATA ON ANCIENT SEAS

NEW YORK, N. Y., Nov. 12 — Dr. Harold C. Urey, world-renowned physicist and associates at the Institute for Nuclear Studies, University of Chicago, headlined the Friday afternoon session of the 61st annual meeting of the Geological Society of America in the Keystone Room, Pennsylvania Hotel, when they presented a discussion of their study of "Method for Measurement of Paleotemperatures".

Dr. Urey revealed how these studies have recently disclosed the abundant heavier isotopes of oxygen in calcium deposits from the famous Cretaceous chalk cliffs of Dover, England, and how they might be used as a temperature measuring device of ancient sea water. Fossils from the chalk lived 70 million years ago in water perhaps as warm as present tropical seas.

1949 GEOLOGICAL SOCIETY OFFICERS ELECTED

DR. CHESTER RAY LONGWELL, New Haven, Conn. Elected 1949 President of the GEOLOGICAL SOCIETY OF AMERICA at its 61st Annual Meeting.

—Bachrach

Professor Longwell is Chairman of the Department of Geology, Yale University, New Haven, Conn. He is a member of the National Research Council and has been on the staff of the U. S. Geological Survey since 1920; he is also a member of the National Academy of Science and other honorary and professional organizations. His many scientific publications and textbooks have dealt with varied geological investigations in many parts of the United States, particularly with the areas in the Southwest, the Muddy and Virgin Mountains of Nevada.

NEW YORK, N. Y., Nov. 11 — New officers of the Geological Society of America, elected at the 61st annual meeting opening session in the Ballroom of the Pennsylvania Hotel, are:

1949 President: Dr. Chester R. Longwell, Chairman of the Department of Geology, Yale University, New Haven, Conn.

1949 Vice-Pres.: W. W. Rubey, U. S. Geological Survey, Washington, D. C.

1949 Vice-Pres.: A. O. Woodford, Claremont, California.

1949 Vice-Pres.: Wendell P. Woodring, U. S. Geological Survey, Washington, D. C.

1949 Vice-Pres.: M. A. Peacock, University of Toronto, Toronto, Canada.

1949 Secretary: Dr. Henry R. Aldrich, Leonia, New Jersey.

1949 Treasurer: Dr. J. E. Hoffmeister, University of Rochester, Rochester, N. Y.

1949 Councilors: Prof. James Gilluly, Univ. of Calif. at Los Angeles, Los Angeles; Dr. John W. Ambrose, Toronto, Canada; Dr. Siemon W. Muller, Dept. Geology, Stanford University, Calif.; Dr. Thomas B. Nolan, U. S. Geological Survey, Washington, D. C.; Dr. Charles A. Anderson, U. S. Geol. Survey, Prescott, Arizona; Dr. Ernst Cloos, The Johns Hopkins Univ., Baltimore, Md.; Dr. M. King Hubbert, Shell Oil Co., Inc., Houston, Texas; Mr. George M. Fowler, Joplin Nat'l Bank Bldg., Joplin, Missouri; Dr. F. J. Pettijohn, Dept. of Geology, Univ. of Chicago, Ill.; Dr. Earl Ingerson, U. S. Geological Survey, Washington, D. C.

El Paso, Texas was chosen for the meeting place of the next annual meeting a year from now.

Retiring President of this Society is Prof. James Gilluly, Department of Geology, University of California at Los Angeles, Los Angeles, California.

PROFESSOR JAMES GILLULY, 1948 President of the GEOLOGICAL SOCIETY OF AMERICA. Chairman of the Department of Geology, University of California at Los Angeles, Los Angeles, Calif.

Dr. Gilluly, a member of the National Research Council and numerous other scientific groups, has been with the U. S. Geological Survey since 19221. He has written many articles in professional journals on the subjects of petrology, stratigraphy of Utah, and economic geology of districts in New York, Utah, Oregon, and Arizona.

SUBMARINE CANYONS AT LA JOLLA, CALIFORNIA ARE STUDIED

Renowned Marine Geologist Reports on Deep-water Photos

NEW YORK, N. Y., Nov. 11—Dr. Francis P. Shepard of Scripps Institution of Oceanography, La Jolla, California, leading authority on the geology of ocean basins and the continental shelves, reported to the Geological Society of America 61st annual meeting at the Pennsylvania Hotel on details seen by a diver, who had made over a period of a year 62 descents, none deeper than 190 feet.

These observations, plus undersea photographs, disclosed the two main canyons in the area had steep slopes, overhanging rock walls, narrow tributaries entering either at grade or as hanging valleys—in all resembling the adjacent land canyons. The evidence suggests that the canyons were excavated by streams and that the heads of the canyons are being filled but that the fill is removed from time to time by mud flows.

This work represents research carried out by the Office of Naval Research, the Hydrographic Office, and the Bureau of Ships under contract with the University of California.

SHORE CONTROL PROBLEMS STUPIED BY GEOLOGISTS

Need for Shore Rehabilitation Emphasized

NEW YORK, N. Y., Nov. 13—Practical problems of shore control were given thorough discussion by Martin A. Mason of the Beach Erosion Board, Washington, D. C., as he addressed the Engineering Geology group during the 61st annual meeting of the Geological Society of America.

Mr. Mason called attention to the average annual loss of land of the United States equivalent to about a one-foot strip over our entire 52,000 miles of shoreline, a loss of 6,400 acres in land area per year. He related how some islands in the Chesapeake Bay area had disappeared by erosion, and told of unprotected shores of both developed and agricultural lands now being lost at rates as high as 15 feet yearly.

He urged geologists to share the problems of the engineers in rehabilitating and stabilizing beach areas, maintaining harbor-entrance channels, and the harbor protective works.

New Books

SUBMARINE GEOLOGY — by Francis Parker Shepard. 1948. 338 pp., 106 illustrations, $6.00. The first full and authoritative volume on the most recently developed of the branches of geology. Of interest to economic geologists, especially petroleum and engineering geologists, and to students of physical geology, glaciology, volcanology, sedimentation, and paleoecology. Treats of the origin of submarine canyons and of coral reefs, continental shelves, continental slopes, tidal waves, etc. For the most part it is nontechnical. Harper & Brothers, 49 East 33d St., New York 16, N. Y.

MINERALS OF CALIFORNIA — by Joseph Murdoch and Robert W. Webb. 1948. 402 pp., 4 pls., 1 fig., $3.00. (Bulletin 136, California State Division of Mines). A new greatly enlarged and completely rewritten revision of "Minerals of California". It describes 516 definite mineral species, representing about one-quarter of the total in the world. 39 of these species have not yet been found elsewhere in the world. The bibliography, containing some 2000 titles, is the most comprehensive yet assembled on California minerals. Historical and geologic sketches of famous mineral localities include the Mother Lode, Crestmore, Searles Lake, Pala, and Mesa Grande. Color plates show benitoite, neptunite, gold, kunzite, essonite, and tourmaline. California State Division of Mines, Ferry Building, San Francisco 11, Calif.

ELECTRON MICROSCOPE IS EXPECTED TO TELL SECRETS OF MINERALS

Shows Unique Tubular Clay Crystals

NEW YORK, N. Y., Nov. 11 — Unusual curled, tubular crystals of one of the clay minerals have been discovered by magnifying the tiny particles 5,000 to 60,000 times in the electron microscope. The mineral is hallosite and the tubes are about 2,000 times thinner than human hair.

These facts were discussed today by Thomas F. Bates of Pennsylvania State College before the Geological Society of America.

Professor Bates further explained that many striking details are revealed by the electron microscope studies. Most of the tubes are split parallel to their length and uncurl to varying extent. Often one tube is found inside another.

It is believed that much of the splitting takes place when the mineral dries out in the laboratory. It is probable that the original, solidly tubular, moist material has never actually been seen at high magnifications because of the heat generated by the electron beam used in the microscope.

It is possible that by providing new possibilities of differential filtering of fluids the tubular nature of these small particles may prove to be of industrial importance. Large deposits of the mineral are found in Indiana (where it is called indianaite), and smaller amounts are present in North Carolina, Texas, Ohio and many other states.

MINERALOGISTS HONOR SIR LAWRENCE BRAGG OF ENGLAND

Awarded the gold Roebling Medal for Work on Crystal Structure

NEW YORK, N. Y., Nov. 12—To Sir William Lawrence Bragg, Nobel Prize winner in 1915 and Cavendish professor of physics at Cambridge University, England, went the Roebling Medal for 1948, awarded by the Mineralogical Society of America in recognition of his outstanding contributions in the field of minerals and crystal structure. The presentation was made at the Hotel Pennsylvania following the society's annual luncheon by President Martin A. Peacock, University of Toronto, Canada. Tribute was paid the recipient for his significant work in the various branches of science represented by the Mineralogical Society.

Sir Lawrence will lecture at Columbia University and Brooklyn Polytechnic Institute, continuing the series at Massachusetts Institute of Technology, Harvard, Rochester, Michigan, Chicago, and Toronto Universities, with five talks at the Mellon Institute, sponsored by the University of Pittsburgh.

PALEONTOLOGICAL SOCIETY SELECTS FIRST WOMAN PRESIDENT

Dr. Winifred Goldring of Albany Is Honored

Dr. Winifred Goldring
—Blackstone Studios

New York., Nov. 11 — The Paleontological Society of America today chose as 1949 President of their group Dr. Winifred Goldring of the New York State Museum, Albany, New York. Election of officers was held during the fortieth annual meeting at the Pennsylvania Hotel.

Other 1949 officers selected were:

Vice-President: Dr. Norman D. Newell, American Museum of Natural History, New York City.

Secretary: Prof. H. E. Vokes, The Johns Hopkins University, Paltimore, Maryland.

Treasurer: Prof. Frank M. Swartz, Pennsylvania State College, State College, Pa.

Editor: Prof. A. Scott Warthin, Vassar College, Poughkeepsie, N. Y.

Dr. Wendell P. Woodring of the U. S. Geological Survey, Washington, D. C., is the retiring president of this Society.

El Paso, Texas was chosen for the next annual meeting place a year from now.

MINERALOGICAL SOCIETY ELECTS 1949 OFFICERS

NEW YORK, N. Y., Nov. 11 — New officers of the Mineralogical Society of America, elected at the 29th annual meeting of the Society in session at the Pennsylvania Hotel this weekend are:

1949 President: Dr. John W. Gruner, University of Minnesota, Minneapolis, Minn.

Vice President: Dr. J. D. H. Donnay, The Johns Hopkins University, Baltimore, Maryland.

Secretary: Dr. C. S. Hurlbut, Jr., Harvard University, Cambridge, Mass.

Treasurer: Dr. Earl Ingerson, U. S. Geological Survey, Washington, D. C.

Editor: Dr. Walter F. Hunt, University of Michigan, Ann Arbor, Michigan.

Councilor: Dr. Lewis S. Ramsdell, University of Michigan, Ann Arbor, Michigan.

Retiring President of this Society is Prof. M. A. Peacock, University of Toronto, Toronto, Canada.

El Paso, Texas was chosen for the meeting place of the next annual meeting a year from now.

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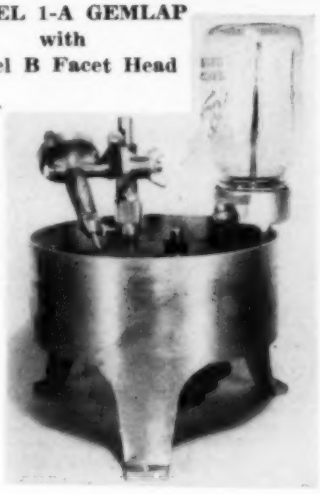

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